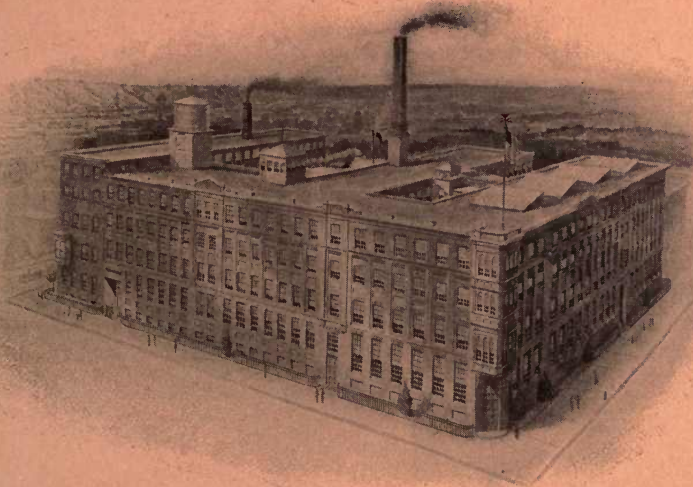


OCT 18 1979

UNIV. OF CALIF. BERK.

# INSTRUMENTS FOR FOREST WORK



## KEUFFEL & ESSER CO.,

MANUFACTURERS,

127 FULTON ST.,

**NEW YORK.**

Branches:

111 Madison St., Chicago.

708 Locust St., St. Louis.

303 Montgomery St.,

San Francisco.

1904

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KEUFFEL & ESSER Co.



Pb  
SEP  
FORE

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FORE

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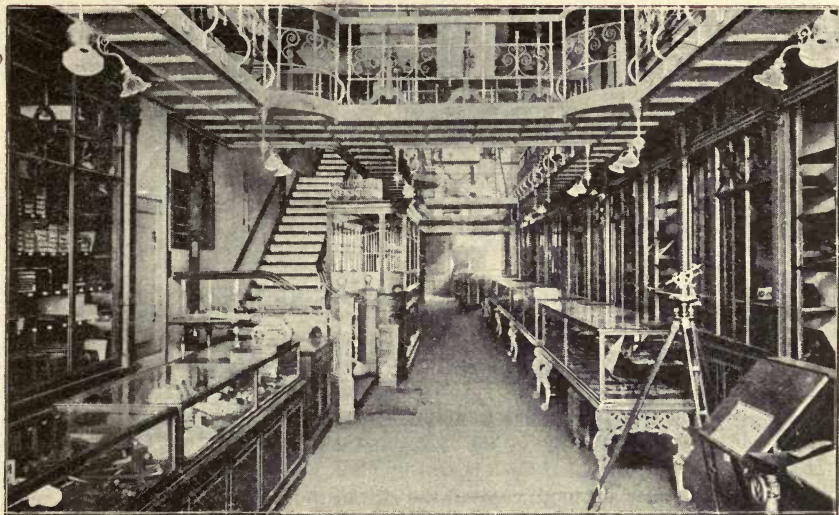
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\*RETAIL DEPARTMENT, FULTON STREET.

NEW YORK, March, 1904.

The great increase in the demand for instruments and tools for

### FOREST WORK

has induced us to issue this special catalogue. We have had the privilege of participating in the developing of many instruments used and recommended by the Bureau of Forestry in Washington, and take this occasion to extend our thanks to the several forest experts who have aided us by their advice and suggestions.

It is our aim to gain and maintain for this line the same high reputation which we are enjoying since many years for our

#### Drawing Materials, Surveying Instruments, Measuring Tapes.

These are described in our General Catalogue (500 pages), which we send free on application.

Those of the articles in our General Catalogue which are commonly used also for forestry work, are repeated in this list under the same numbers which they bear in our general catalogue.

We hope that we shall succeed in meriting the patronage of those who are interested in the articles here described.

Very respectfully,

KEUFFEL & ESSER CO.

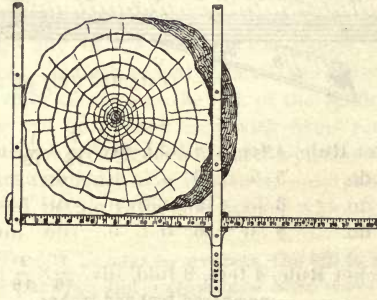
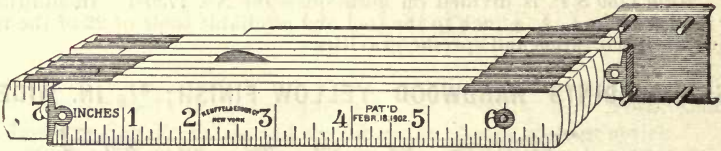


KEUFFEL & ESSER CO. NEW YORK.

## TREE CALIPERS.

### FOLDING POCKET CALIPERS.

Patented Feb. 18, 1902.



No. 4300.

The Folding Pocket Calipers are of the style of the K & E Ivorine Pocket Rules, described under Nos. 1730-4 Ivorine, etc., on preceeding page. They are  $\frac{3}{4}$  in. wide by about  $\frac{1}{8}$  in. thick and have stout steel springs to hold the folds in alignment, and the patent metal tips. The beam of this caliper is also a handy and correct 48 in. pocket rule.

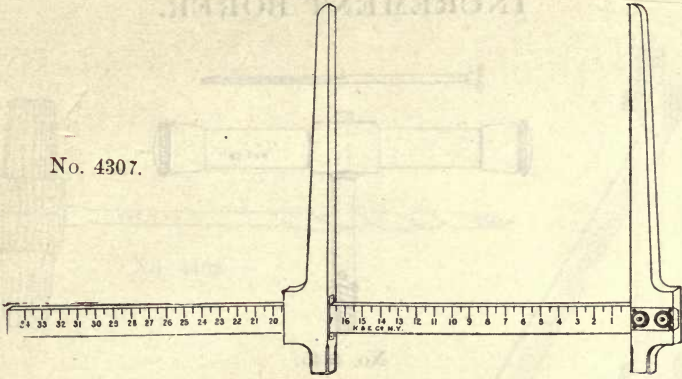
One side of the 8 fold beam is blank for the first 3 folds and the other 5 folds, the beam of the caliper, are divided to inches and sixteenths. The 3 blank folds are set at right angle to the balance of the rule and are there held by a pivoted nickelplated brace, as shown in cut, forming the fixed arm. The sliding arm is provided with a nickelplated spring plate, which, when pressed down holds the arm vertical on the beam. It readily passes over the joints of the beam on releasing the pressure on the springplate.

The other side of the caliper is divided over the entire 48 inches into 16ths, to serve as a measuring rule.

4300. Folding Pocket Caliper and Rule, 48 in. Ivorine finish, clamp and spring plate nickelplated, in cloth covered box,  $9\frac{3}{4} \times 2 \times 1\frac{1}{2}$  inches . . . . . each \$ 4 00

## TREE CALIPERS.

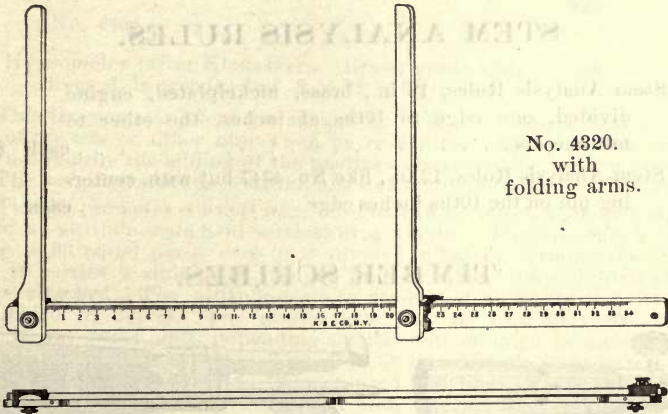
No. 4307.



4305.	Tree Caliper, fine quality hardwood, 18 inch, 1 clamp nut, each	\$ 3 15
4307.	“ “ “ “ “ 34 “ 2 “ “ “	4 50
4309.	“ “ “ “ “ 50 “ 2 “ “ “	5 50

These calipers are of light-colored hardwood, best workmanship, finely finished, both sides of beam graduated to 10ths inches and plainly numbered. The arms are detachable for convenience in transportation. The stationary arm is held by brass clamp nuts with lock nut. The eye of the sliding arm is brass-lined all around.

No. 4320.  
with  
folding arms.



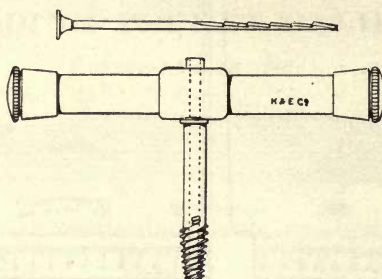
No. 4320 folded.

4320.	Tree Caliper with folding Arms, 34 inch . . . . .	each \$ 5 50
4322.	“ “ “ “ “ 50 “ . . . . .	“ 6 50

These calipers are of light-colored hardwood, best workmanship, finely finished, both sides of beam graduated to 10ths inches and plainly numbered. The arms are attached to solid brass mountings. They are held in position by clamp nuts and the sliding arm has a second clamp on the opposite side for clamping it on the beam.

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## INCREMENT BORER.



No. 4345.

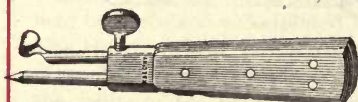
4345. Increment Borer, tubular metal handle, 7", nickelplated . each \$ 6 00

The 3 in. hollow auger with square shank is of steel and with the steel extractor is stored in the hollow handle, which has two screw caps. The Increment Borer (called "Zuwachsbohrer" by German foresters) serves to extract a plug of wood from the standing tree to determine its rate of growth. It will not injure the tree.

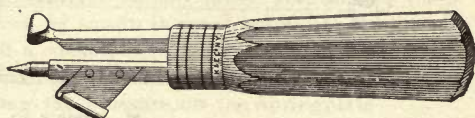
## STEM ANALYSIS RULES.

4347. Stem Analysis Rules, 12 in., brass, nickelplated, engine divided, one edge to 10ths of inches, the other to millimeters . . . . . each \$ 2 50
4348. Stem Analysis Rules, 12 in., like No. 4347 but with centering pin on the 10ths inches edge . . . . . each 3 50

## TIMBER SCRIBES.



No. 4350.



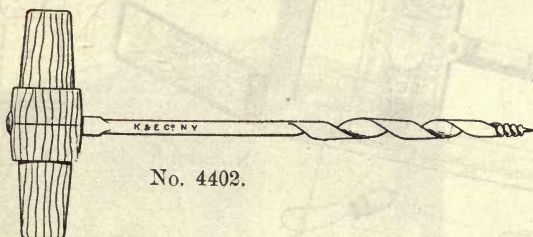
4352.

4350. Timber Scribe, wooden handle, small, (5 1/2 inch) . . . . . each \$ 75
4352. " " " " large, (6 1/2 " ) . . . . . " 1 00

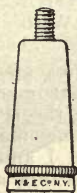


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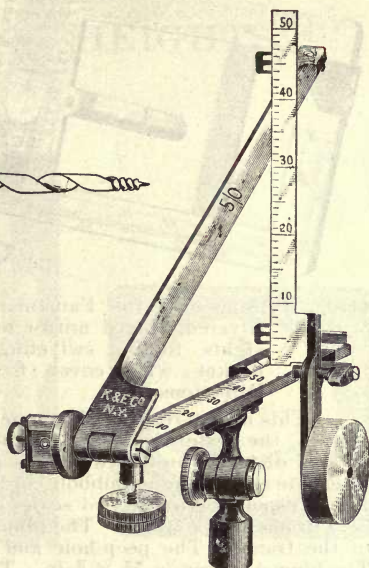
## HYPSONETERS.



No. 4402.



No. 4404.



No. 4400.

4400. Hypsometer (after Klaussner). Brass, graduated surfaces silvered, in wooden box,  $8 \times 2\frac{3}{4} \times 2\frac{3}{8}$  inches . . . . . each \$26 00

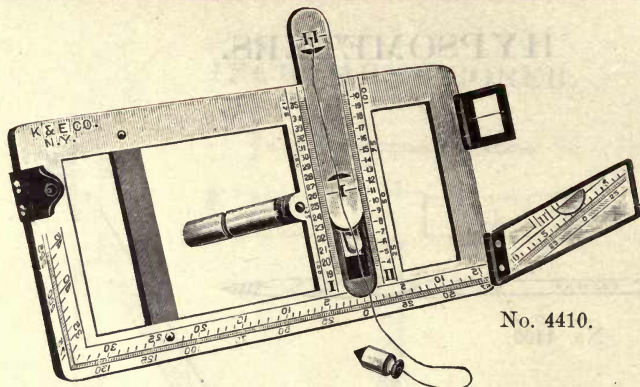
This Hypsometer offers the advantage over most others that the total height of the tree or other object can be read direct from one scale and that it does not require the adding of the readings above and below the observer's level. The weighted altitude-scale is much steadier in the wind than a plumb-bob.

This Hypsometer consists of a base rule (6 in. long), a hinged sighting rule and an altitude-scale held vertical by a weight. The base rule is graduated up to 60 equal parts, each part divided to halves, forming the distance scale. It carries a slide with reading line, to which the weighted altitude scale is attached. The altitude-scale is graduated to 50 equal parts, each part divided to halves. The graduations may be read as yards, meters, feet or in any other unit, depending on the unit adopted in measuring the base line (object to observer). The slide of the altitude-scale is set on the distance scale to correspond to the measured base line. The sighting rule is hinged to the near end of the base rule, and, like the base rule, has a hair-line sight at its further end. At the joint of these two rules is a revolvable peep sight, which can be directed to either of the two hairlines by a milled disk. After sighting the base of the object along the base rule, the sighting rule is raised by means of a high pitch thumbscrew, until its hairline cuts the top of the object. The instrument has a jointed ferrule with clamp screw threaded to fit the regular photographer's tripod screw.

4402. Support with Gimlet, for attaching to a tree or post, hard wood cross piece . . . . . each \$ 1 00
4404. Brass Ferrule, to fit the support with Gimlet, or Jacob Staff, or tripod . . . . . " 1 00

For Jacob staff and Tripods see page 9.

This hypsometer is particularly adapted in cases where necessity of haste or the roughness of country make the use of a tripod impracticable. The results obtained are more accurate when using a tripod than without one.



No. 4410.

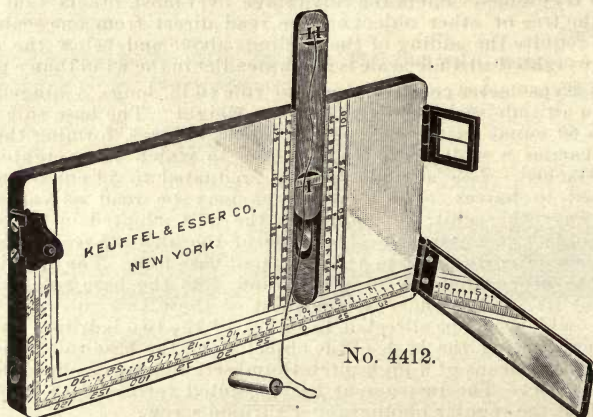


No. 4411.

4410. Hypsometer (after Faustmann), brass, graduated surface silvered, hinged mirror mounted in aluminum, folding sights, folding swiveling handle. In cloth covered pocket with cover flap,  $3\frac{1}{2} \times 7\frac{1}{2} \times \frac{3}{8}$  in. With Directions . . . . . each \$19 50

This mirror-reading Hypsometer is  $3\frac{1}{4} \times 7$  in. It is provided with two scales: the scale of heights on the lower edge of the instrument and the scale of distances on the two edges of the groove in which the slide moves. The slide carries the plumbbob cord and has two reading lines marked I and II, corresponding to the two scales of distances, also marked I and II. It is held in place by a spring. The plumbbob is stored in a small tube at the back of the frame. The peep-hole and hairline sights are hinged to fold down. The hinged mirror is  $5\frac{3}{4} \times \frac{3}{4}$  in. The cylindrical nickel-plated metal handle on the reverse side of the instrument swivels and also folds down.

4411. Brass Ferrule, to fit the support with Gimlet, (No. 4402, pp. 5) or Jacob staff, or tripod. . . . . each \$ 1 00  
For Jacob Staff and Tripods see page 9.



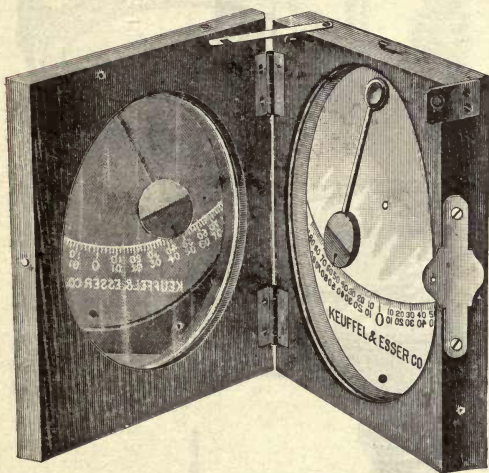
No. 4412.

4412. Hypsometer (after Faustmann), like No. 4410, but of polished hardwood, graduations on white facing with protective coating, hinged mirror mounted in aluminum, folding sights. Cloth covered pocket with cover flap,  $3\frac{1}{2} \times 7\frac{1}{2} \times \frac{3}{8}$  in. With Directions. . . . . each \$ 6 50



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## CLINOMETER FOR MEASURING HEIGHTS.



4440.

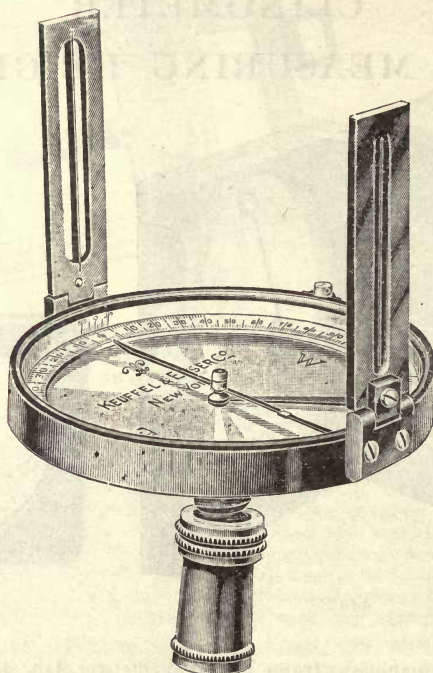


4442.

4440. Clinometer, mahogany frame with hinged cover,  $4\frac{1}{2} \times 4\frac{1}{2} \times 1$  in., silvered metal dial with cover glass. Graduated to percentage of angle to 100% each way (by 2%), numbered at each 10%, with a second row of numbers reversed for reading in mirror. The pendulum is held by a spring, except when released by pressing a button on the reverse side of the frame, so that its location can be conveniently read on the scale. The upper edge has a peep sight and sighting pin. In the cover there is a circular mirror for reading the position of the pendulum while sighting . . . . . each \$ 8 00

4442. Clinometer, mahogany frame  $3 \times 3 \times \frac{1}{2}$  in., silvered metal dial with cover glass. Graduated to percentage of angle to 100% each way (by 2%), numbered at each 10%. The top or bottom of the frame serve as fiduciary edge and for sighting. The pendulum is held by a spring, except when released by pressing a button on the reverse side of the frame so that its location can be conveniently read . . . . . each \$ 4 00

## COMPASSES.



No. 5321.

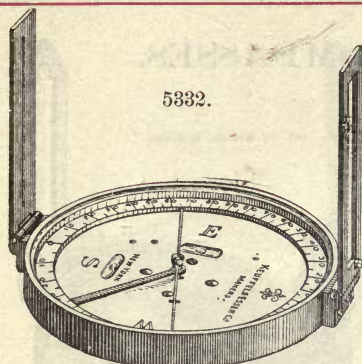
- |       |   |               |
|-------|---|---------------|
| 5320. | Surveying Compass, with folding sights, graduated to degrees on raised ring, variation plate, two level bubbles, ball joint and socket for Jacob staff mounting, needle about $3\frac{1}{2}$ in., in polished mahogany Case . . . | each \$ 16 00 |
| 5321. | do. do. needle about 4 in., in polished mahogany Case . . .   | " 18 00       |
| 5322. | do. do. needle about $4\frac{1}{2}$ in., in polished mahogany Case . . .  | " 20 00       |

Compasses No. 5320 to 5322 are of the most practical construction and very carefully and substantially made. The variation of the needle is set off by means of a pinion with capstan head, which admits of very precise adjustment. With these compasses we furnish adjusting pins of phosphor bronze, which do not disturb the needle.

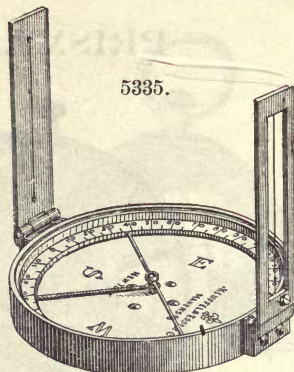
For Jacob Staff and Tripods see page 9.



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5332.

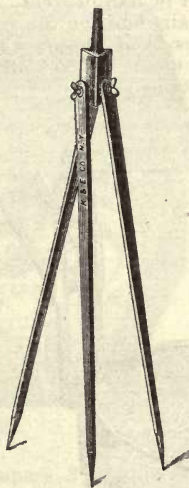


5335.

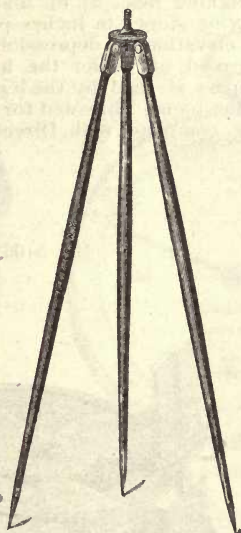
5332. Surveying Compass, with folding sights, graduated to degrees, with 2 level bubbles, ball joint and socket for Jacob staff mounting, needle about 3 in., in mahogany Case, each \$ 10 50
5333. do. do. " " 3½ " " " " " 11 50
5334. do. do. " " 4 " " " " " 13 00
5335. Surveying Compass, like No. 5332, but without level bubbles, needle about 2½ in., in mahogany Case . each \$ 8 00
5336. do. do. " " 3 " " " " " 9 00
5337. do. do. " " 3½ " " " " " 11 00
5338. do. do. " " 4 " " " " " 11 50



5350.



5351.



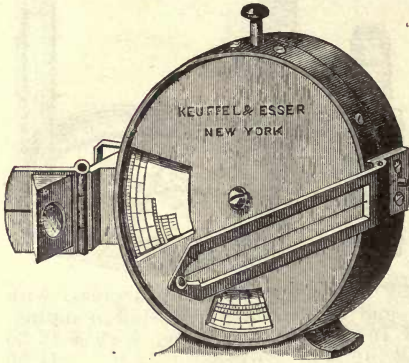
5356.

5350. Jacob Staff, 54 in., hardwood, iron shoe . . . . . each \$ 1 00
5351. Tripod, hardwood, with Jacob staff head, light, for compasses, No. 5320—5338 . . . . . " 3 00
5356. Tripod, hardwood, with Jacob staff head, light, for compasses, No. 5300—5338 . . . . . " 5 00

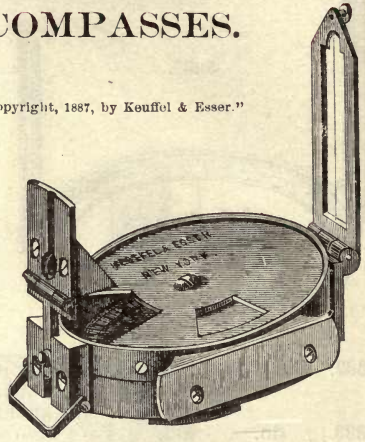
KEUFFEL & ESSER CO. NEW YORK.

## PRISMATIC COMPASSES.

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as Clinometer.

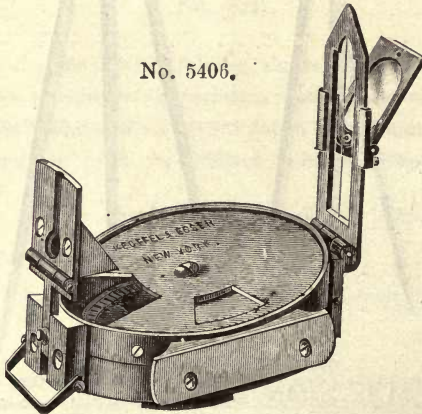


as Compass.

No. 5400.

5400. Prismatic Compass, Clinometer and Altimeter, bronzed, pocket size. Compass dial  $2\frac{3}{4}$  in. diameter, graduated to  $\frac{1}{2}$  degrees, agate centre, automatic stop and spring check. Hinged sight-vane with vertical wire, fiduciary edge for clinometer. Clinometer and Altimeter formed by accurately balanced, sensitive, weighted disc,  $2\frac{3}{4}$  in. diameter, with stop and spring check, giving slopes in inches per yard and in degrees, and angles of elevation or depression in half-degrees. The inclination is read off under the hair line on the cover glass. The compass is read by the lens-front prism, which is adjustable for focus. Threaded for mounting on staff, in leather sling Case, complete, with Directions . . . . . each \$ 27 00

No. 5406.

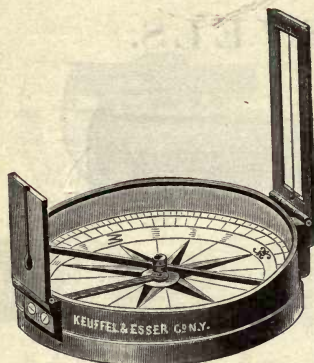


5406. Hand Transit, prismatic compass, clinometer and altimeter, like No. 5400, but with reversible, sliding, adjustable mirror for determining the bearing, in the horizontal plane, of objects above or below the level of the observer . . . . . each 30 00

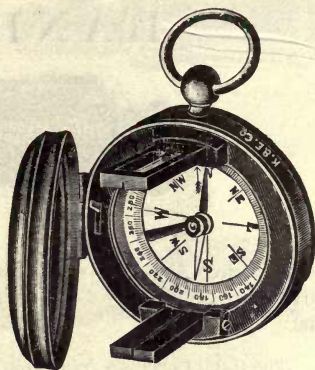


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No. 5441.



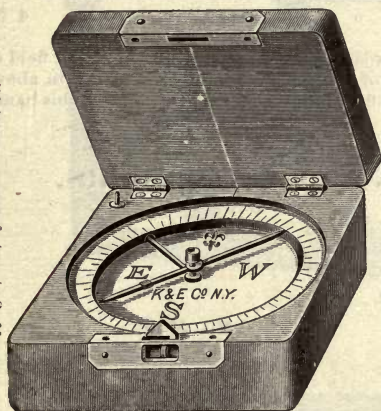
5450.

5440. Bronzed Pocket Compass,  $2\frac{1}{2}$  in., with cover, folding sights, edge bar needle with stop, each \$ 5 25

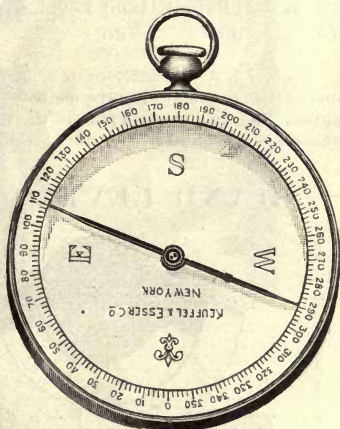
5441. do. do. do. do. 3 in. " 6 25

5450. Pocket Compass, watch pattern, with folding sights, stop to needle,  $1\frac{3}{4}$  2  $2\frac{3}{8}$  in.  
each \$ 4 00 4 60 5 10

"Copyright, 1894, by Keuffel & Esser Co."



No. 5602.



5603.

5602. Military Compass,  $3 \times 3$  in., needle 2 in. with agate centre and automatic stop, divisions on raised metal ring, to degrees. Polished mahogany with sighting line on lid. The sides of the box serve as fiduciary edges. . each \$ 3 50

5603. Forester's Compass, 3 in., nickel-plated, graduated on raised ring to 1 degree, fine bar needle, about  $2\frac{3}{8}$  in., agate centre, stop to needle (from knob). . . . . " 4 50

KEUFFEL & ESSER CO. NEW YORK.

## HAND LEVELS.

"Copyright, 1890, by  
Keuffel & Esser Co."



No. 5700.

5700.	Locke's Hand Level, German Silver, 5 in., in Case . . . .	each	\$ 8 00
5701.	do. Bronzed, 5 " " " " . . . .	"	7 00
5702.	do. Brass, plain, 5 " " " " . . . .	"	5 00

The Hand Level is a great help in chaining accurately in the shortest possible time. Nos. 5700 and 5701 have telescoping eye-piece and magnifying lens for the bubble.

"Copyright, 1894, by Keuffel & Esser Co."



Patented April 24, 1894.

No. 5703.



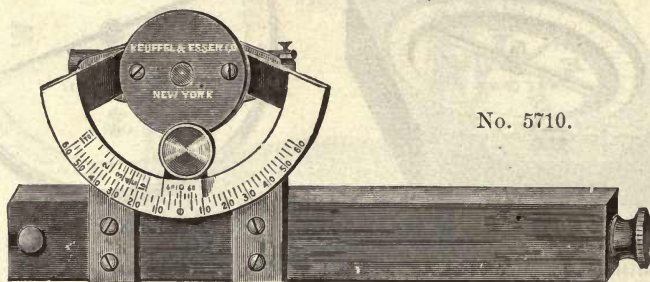
Diagram, showing  
appearance of field

5703.	K & E Patent Hand Level, square tube, bronzed, 5 in., in Case, each	\$ 4 50
5704.	do. do. " " nickel-plated, " "	4 50

In No. 5703 the reflector is a narrow prismoid, crossing the middle of the field of view, so that the field appears on both sides of the reflected bubble, as shown in above diagram. As the lower surface of the tube is flat and parallel with the bubble, this hand-level can be used also as a contact level.

## HAND LEVELS AND CLINOMETERS.

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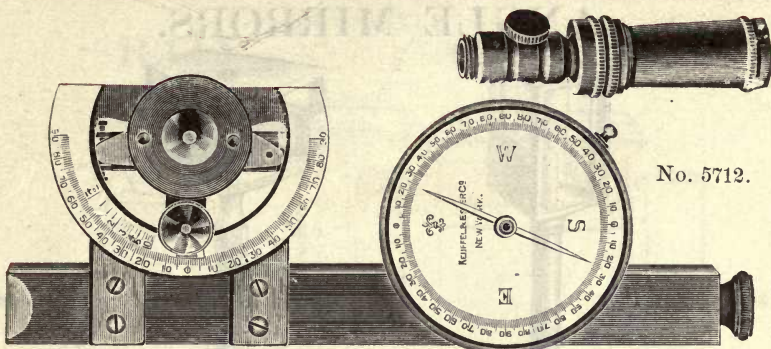
No. 5710.

5710.	Abney's Reflecting Level or Pocket Altimeter, 5 in., improved, with arc divided to degrees for 60° in each direction, vernier reading to 5 minutes, gradients 1:1 to 1:10, in sewed leather case. . . .	each	\$ 13 50
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For Jacob staff and tripod see page 9.



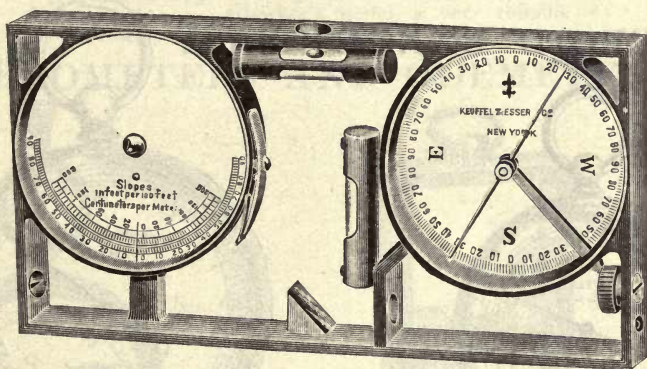
KEUFFEL & ESSER CO. NEW YORK.



No. 5712.

5712. K & E Abney Level, 6 in., arc graduated to degrees for  $90^\circ$  in both directions, vernier to 5 minutes, Gradients from 1:1 to 1:10. Base of tube is finished, so that the instrument can be used also as a contact level. Compass 2 in., silvered dial divided to degrees, needle about  $1\frac{1}{2}$  in., agate centre and stop. Two screw sockets, so that level can be mounted on the ball joint socket either with the arc vertical or with the compass horizontal.

Instrument complete with ball joint and socket, in stout sewed, velvet lined leather sling Case . . . . . each \$20 00



No. 5718

5718 K & E Pocket Omnimeter, in sewed leather case . . . . . each \$15 00

5719 " " " like No. 5718, but with sights along one side of the frame, which fold into the frame, in sewed leather case . . . . . " 18 00

The K & E Pocket Omnimeter combines a compass, clinometer, hand level, plumb and contact level, so that it will indicate magnetic bearings, azimuth angles, altitudes, levels and slopes. The Omnimeter with folding sights will indicate azimuth angles in their horizontal plane.

The combination is arranged in a rectangular frame of aluminum alloy,  $5\frac{1}{4} \times 2\frac{5}{8} \times \frac{1}{2}$  in. and weighs about 5 ounces. The frame serves also as fiduciary edge.

The Compass of 2 in. diameter, has a needle with agate centre and stop. It is graduated to 2 degrees, numbered in quadrants at every ten degrees.

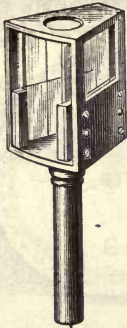
The Clinometer of 2 in. diameter, is of the pendulum disc pattern. It is graduated to 2 degrees, reading to 90 degrees in either direction and to percentage of slope.

The prism of the hand level is attached to one of the long sides and its bubble is on the opposite side of the frame.

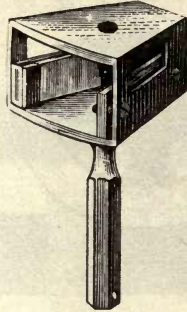
The bubbles are as sensitive as is permissible in a hand level.

KEUFFEL & ESSER CO. NEW YORK.

## ANGLE MIRRORS.



No. 5750.

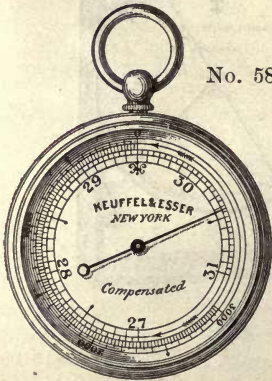


5751.

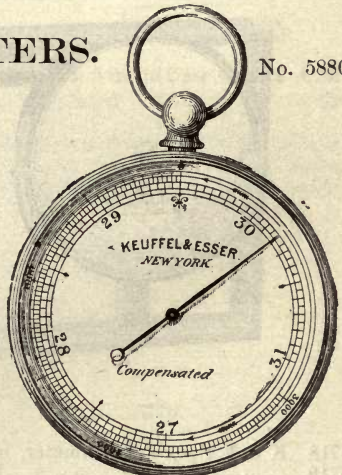
5750. Angle Mirror, for angles of 90 degrees, with small plumbbob. The handle can be unscrewed and stowed in frame of instrument. Size of instrument  $2\frac{1}{4} \times 2 \times 1\frac{3}{4}$  in., in morocco Case . . . . . each \$ 7 50

5751. Angle Mirror, plain. for angles of 90 degrees in morocco Case, " 5 00

## ANEROID BAROMETERS.



No. 5855.



No. 5880.

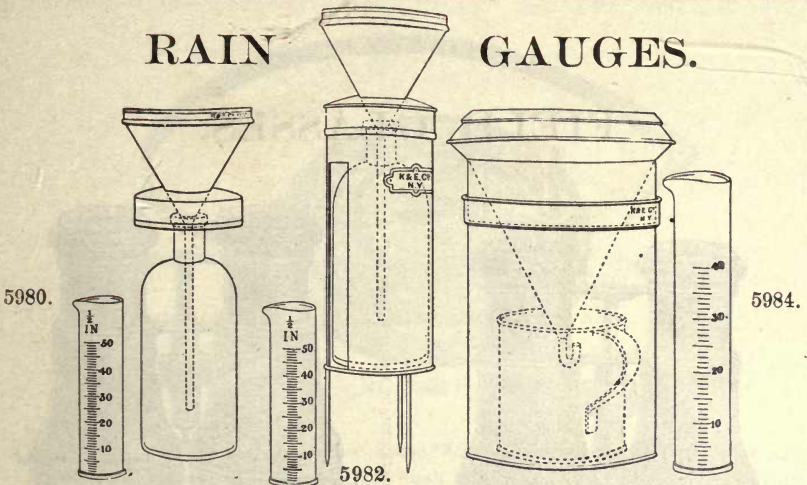
- |       |  |         |       |
|-------|--|---------|-------|
| 5855. | Watch pattern, gilt case, $1\frac{3}{4}$ in. diameter, silvered dial, revolving scale 3000 feet, compensated for temperature, in morocco Case . . . . .            | "       | 20 00 |
| 5856. | Like No. 5855, but altitude scale 6000 feet . . . . .  | "       | 18 80 |
| 5857. | " " 5855, " " " 12000 " . . . . .  | "       | 20 00 |
| 5858. | " " 5855, " " " 18000 " . . . . .  | "       | 21 50 |
| 5880. | Pocket pattern, brass case, $2\frac{1}{2}$ in. diameter, silvered dial, revolving altitude scale 3000 feet, compensated for temperature, in morocco Case . . . . . | each \$ | 21 00 |
| 5881. | Like No. 5880, but altitude scale 6000 feet . . . . .  | "       | 20 00 |
| 5882. | " " 5880, " " " 12000 " . . . . .  | "       | 21 00 |
| 5883. | " " 5880, " " " 18000 " . . . . .  | "       | 22 00 |



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# RAIN

# GAUGES.

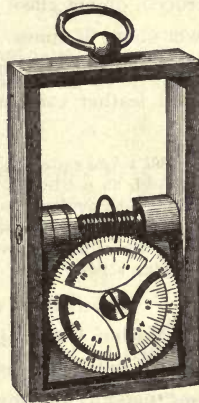


- |       |  |              |
|-------|--|--------------|
| 5980. | Rain Gauge, Howard's model, simple construction, with graduate reading to $\frac{1}{100}$ in., . . . . .       | each \$ 4 00 |
| 5982. | do. do. Symon's model, with prongs to prevent tipping, with graduate reading to $\frac{1}{100}$ in., . . . . . | " 6 00       |
| 5984. | do. do. Glaisher's model, a very reliable instrument, with graduate reading to $\frac{1}{100}$ in., . . . . .  | " 8 50       |

## PEDOMETERS AND ODOMETERS.



No. 6905.



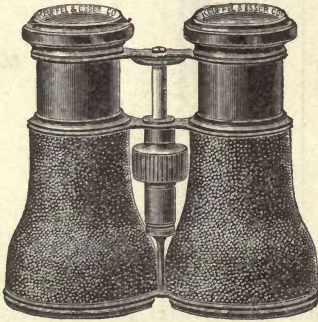
No. 6910.

- |       |  |              |
|-------|--|--------------|
| 6900. | Pedometer, watch pattern, nickel case, $1\frac{3}{4}$ in., registering 12 miles by $\frac{1}{4}$ miles . . . . . | each \$ 4 50 |
| 6901. | do. do. registering 50 miles by 80 yards . . . . .   | " 5 25       |
| 6905. | Passometer, watch pattern, nickel case, $1\frac{3}{4}$ in., registering to 100,000 steps . . . . .               | each \$ 6 50 |

Pedometers No. 6900 and 6901 indicate the distance walked. The hand advances in proportion to the length of stride, as the instrument is adjustable by an easily accessible screw. Passometer No. 6905 registers the number of steps walked and is not adjustable to length of stride. The distance walked can be computed from the number of steps registered.

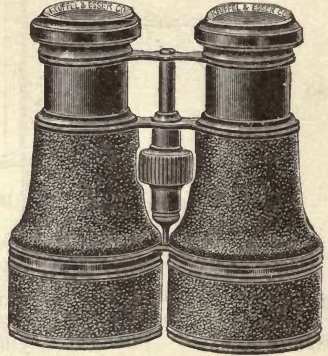
- |       |  |               |
|-------|--|---------------|
| 6910. | Odometer of Brass, with silvered dials, in dust proof leather case with straps . . . . . | each \$ 15 00 |
|-------|--|---------------|

## FIELD GLASSES.



No. 6927.

"Copyright, 1894, by Keuffel & Esser Co."



No. 6935½.

6927. Field and Marine Glass, japanned and covered with morocco, object glass 24 lines, 8 lenses, magnifying power about  $3\frac{3}{4}$  times. The telescoping bar is independent of the focusing screw, as described above. In soft leather case, with handle . . . . . each \$ 15 75

The glass No. 6927 represents a happy compromise between the magnifying power and the size of the field, as neither of these factors has been reduced at the expense of the other. This makes it particularly well adapted for a search glass and for general use. The focusing screw is independent of the telescoping arrangement, so that closing the glass and drawing the tubes out will not disturb the focus to which they have been adjusted by the focusing screw.

6935. Field and Marine Glass, japanned and covered with morocco, with sun shades, object glass 21 lines, 6 lenses, magnifying power about 3 times. Glass in sole leather case with handle and shoulder strap . . each \$ 12 75

- 6935½. Field and Marine Glass, like No. 6935, but object glass 24 lines . . . . . " 14 20



KEUFFEL & ESSER CO. NEW YORK.



No. 7262 D. P.

**Cornell K & E Steel Tree Tape,  $\frac{3}{8}$  in. wide,** stout bent leather case, patent centre, long swiveling flush folding handle, opened by pushing handle pin from opposite side of case. Nickel plated mountings. Jointed anchor peg for attaching to tree. Graduations begin **at end of line.**

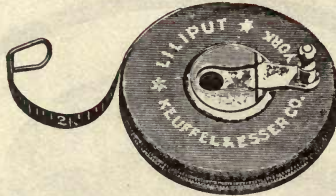
7262. **Cornell K & E Steel Tree Tape,** finest quality, 50 ft., one side divided 10ths and 100ths feet, other side divided in the proportion of circumference to diameter, to feet, 10ths and 100ths, jointed steel peg for fastening end of line to the tree . . . . . each \$ 9 65

As the two sides of this tape are graduated in the ratio of diameter to circumference (1 : 3.1416), either dimension can be read off opposite the other.

**Cornell K & E Steel Tapes,  $\frac{3}{8}$  in. wide,** stout bent leather case, patent centre, long swiveling flush folding handle, opened by pushing handle pin from opposite side of case. Nickel-plated mountings. Graduations begin **at outside end of ring,**

Please order by number.

Length in feet,	25	33	50	66	75	100
10ths of feet . . . . . No. 7250D	7251D	7252D	7253D	7254D	7255D	
12ths " " . . . . . 7250T	7251T	7252T	7253T	7254T	7255T	
each \$	4 15	4 75	6 65	8 45	9 60	11 85
10ths of feet and Links No. 7250DL	7251DL	7252DL	7253DL	7254DL	7255DL	
12ths " " " " 7250TL	7251TL	7252TL	7253TL	7254TL	7255TL	
each \$	4 30	4 95	6 85	8 75	9 90	12 15



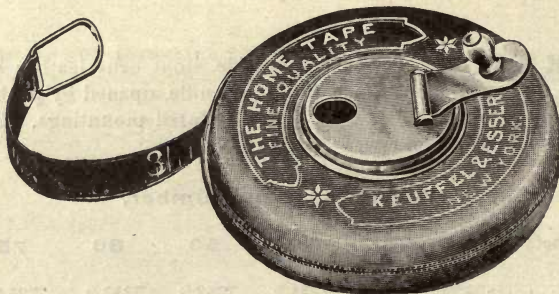
Please order by number.

**Liliput K & E Steel Tape**, 1/4 in. wide, stout bent leather case, patent centre, long swiveling flush folding handle, opened by pushing handle pin from opposite side of case. Nickel-plated mountings. Graduations begin at outside end of ring.

	Length in feet,	25	50
	Dimensions,	$2\frac{1}{4} \times \frac{1}{2}$ in.	$2\frac{3}{4} \times \frac{1}{2}$ in.
	Weight complete,	$3\frac{1}{2}$ oz.	5 oz.
10ths of feet . . . . .	No.	7270 <i>D</i>	7272 <i>D</i>
12ths (inches in sixteenths) . .		7270 <i>T</i>	7272 <i>T</i>
	each	\$ 3 65	4 45

The Liliput Steel Tape is warranted to be of the same grade, workmanship and accuracy as the other **K & E** Steel Tapes. It is made very compact and light and is therefore suitable and convenient for the pocket. It is a durable tape and will wear well.

The Home **K & E** Steel Tapes are intended to supersede the woven tapes which on account of their low price are often used where a more reliable tape ought to be employed. They are of best quality steel and accurately divided. The graduations and figures are bright while the ground surface is nearly black, so that the measurements are easily read. The neat sewed leather case is convenient to use and to carry in the pocket.



Please order by number.

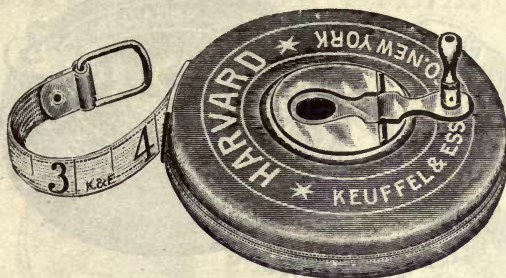
**Home K & E Steel Tapes**, 3/8 in. wide, stout bent leather case, large centre, long folding handle. Nickel-plated mountings. Graduations begin at outside end of ring.

	Length in feet,	25	50	75	100
10ths of feet . . . . .	No. 7350 <i>D</i>	7352 <i>D</i>	7354 <i>D</i>	7355 <i>D</i>	
12ths " " . . . . .	7350 <i>T</i>	7352 <i>T</i>	7354 <i>T</i>	7355 <i>T</i>	
	each \$	3 20	3 90	5 10	6 60



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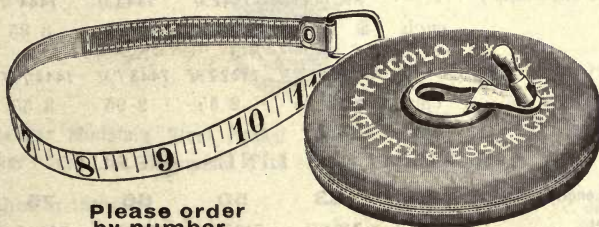
## K & E METALLIC TAPES.



*Harvard* **K & E** Metallic Tapes,  $\frac{5}{8}$  in. wide, stout bent leather case, patent centre, long flush folding handle, opened by pushing handle pin from opposite side of case, all mountings nickel-plated; line interwoven with metal, leather re-enforced end. Graduations begin at outside end of ring.

Please order by number.

Length in feet,	25	33	50	66	75	100
10ths of feet . . . . . No.	7420 <i>D</i>	7421 <i>D</i>	7422 <i>D</i>	7423 <i>D</i>	7424 <i>D</i>	7425 <i>D</i>
12ths “ “ . . . . .	7420 <i>T</i>	7421 <i>T</i>	7422 <i>T</i>	7423 <i>T</i>	7424 <i>T</i>	7425 <i>T</i>
each	\$ 1 95	2 25	2 75	3 05	3 35	4 10
10ths of feet and Links, No.	7420 <i>DL</i>	7421 <i>DL</i>	7422 <i>DL</i>	7423 <i>DL</i>	7424 <i>DL</i>	7425 <i>DL</i>
12ths “ “ “ “	7420 <i>TL</i>	7421 <i>TL</i>	7422 <i>TL</i>	7423 <i>TL</i>	7424 <i>TL</i>	7425 <i>TL</i>
each	\$ 2 05	2 35	2 85	3 25	3 50	4 40

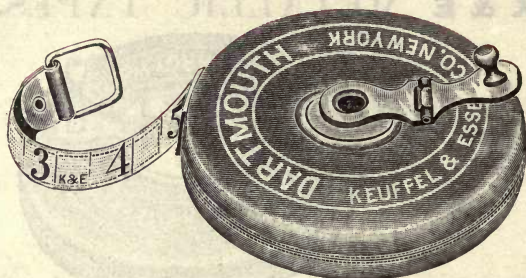


Please order by number.

*Piccolo* **K & E** Metallic Tapes,  $\frac{3}{8}$  in. wide, stout bent leather case, patent improved centre with flush folding handle, all mountings nickel-plated, line interwoven with metal, end re-enforced with leather.

	Length in feet,	25	50
	Size,	$2\frac{3}{4} \times \frac{5}{8}$ in.	$3\frac{5}{8} \times \frac{5}{8}$ in.
	Weight complete,	$4\frac{1}{2}$ oz.	$8\frac{1}{2}$ oz.
10ths of feet . . . . .	No. 7480D	7482D	
12ths " " . . . . .	7480T	7482T	
	each	\$ 1 75	2 20

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**Dartmouth K & E** Metallic Tapes,  $\frac{5}{8}$  in. wide, stout bent leather case, long folding handle, all mountings nickel-plated, line interwoven with metal, leather re-enforced end. Graduations begin at outside end of ring.

Please order by number.

Length in feet,	25	33	50	66	75	100
10ths of feet . . . . .	No. 7440D	7441D	7442D	7443D	7444D	7445D
12ths " " . . . . .	7440T	7441T	7442T	7443T	7444T	7445T
each	\$ 1 65	1 95	2 45	2 75	3 05	3 80
10ths of feet and Links, No.	7440DL	7441DL	7442DL	7443DL	7444DL	7445DL
12ths " " " " . . . . .	7440TL	7441TL	7442TL	7443TL	7444TL	7445TL
each	\$ 1 75	2 05	2 55	2 95	3 25	4 10
Length in Meters,	10	15	20	25	30	
Metric (one side only) . . . . .	No. 7441M	7442M	7443M	7444M	7445M	
each	\$ 1 95	2 45	2 75	3 35	4 10	
12ths of feet and Metric, . . . . .	No. 7441TM	7442TM	7443TM	7444TM	7445TM	
each	\$ 2 05	2 55	2 95	3 55	4 10	

**K & E METALLIC LINES. (RE-FILLS.)**

Length in feet,	25	33	50	66	75	100
10ths of feet . . . . .	No. 7460D	7461D	7462D	7463D	7464D	7465D
12ths " " . . . . .	7460T	7461T	7462T	7463T	7464T	7465T
each	\$ 80	1 00	1 35	1 55	1 75	2 55
10ths of feet and Links, No.	7460DL	7461DL	7462DL	7463DL	7464DL	7465DL
12ths " " " " . . . . .	7460TL	7461TL	7462TL	7463TL	7464TL	7465TL
each	\$ 90	1 10	1 50	1 75	1 95	2 85
Length in Meters,	10	15	20	25	30	
Metric (one side only) . . . . .	No. 7461M	7462M	7463M	7464M	7465M	
each	\$ 1 00	1 35	1 55	1 95	2 55	
12ths of feet and Metric, . . . . .	No. 7461TM	7462TM	7463TM	7464TM	7465TM	
each	\$ 1 05	1 45	1 75	2 15	2 85	





## EXCELSIOR POCKET STEEL TAPES.

Patented June 26, 1894.



Excelsior Steel Pocket Tapes,  $\frac{1}{4}$  in. wide, patent German silver case, with spring and stop.

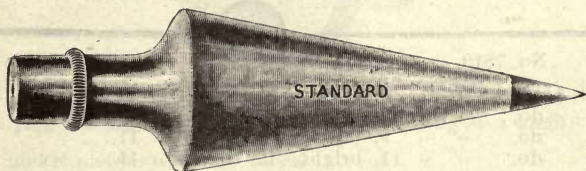
	Length in feet,	3	5	6	9	12
Inches to 16ths . . . . .	No. 7690T	7691T	7692T	7693T	7694T	
	each	\$ 1 00	1 25	1 40	1 90	2 50
Feet to 100ths . . . . .	No. 7690D	7691D	7692D	7693D	7694D	
	each	\$ 1 00	1 25	1 40	1 90	2 50



Excelsior Miniature Steel Pocket Tapes,  $\frac{5}{32}$  in. wide, patent German silver case, 1 in. diameter, with spring and stop,  $\frac{3}{8}$  in.

7707. Inches in 16ths . . . . . each \$1 00

Tapes 7690T, 7691T, 7692T. are numbered inches only, the others are numbered feet and inches, or feet and 10ths.



7777. Standard Plumb Bob, brass, steel point, about 8 oz. . . . . ea. \$ 75  
 " " " " " 12 " . . . . " 1 20



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## MEASURING CHAINS. ARROWS.



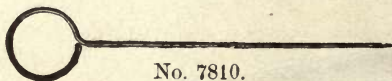
No. 7787 B.

### U. S. STANDARD.

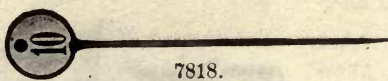
7780A.	Steel, W. G. 12,	Brass Handles, oval rings, 50 feet	each	\$ 4 50
7780B.	do. " " 12,	" " " 100 "	"	8 00
7780C.	do. " " 12,	" " " 33 "	"	3 50
7780D.	do. " " 12,	" " " 66 "	"	6 50
7781A.	do. " " 12,	" " brazed links and rings, 50 feet	"	6 00
7781B.	do. " " 12,	" " " 100 "	"	11 00
7781C.	do. " " 12,	" " " 33 "	"	5 50
7781D.	do. " " 12,	" " " 66 "	"	10 00

Chain 7781 B has a spring-hook (snap) at 50 feet, so that it can be separated there and the handle attached for using it as a 50 foot chain.

7786A.	Iron, W. G. 8,	Brass Handles, 2 round rings, 50 feet	each	\$ 2 50
7786B.	do. " " 8,	" " 2 " " 100 "	"	3 50
7786C.	do. " " 8,	" " 2 " " 33 "	"	2 00
7786D.	do. " " 8,	" " 2 " " 66 "	"	3 20
7787A.	do. " " 8,	" " 3 sawed oval " 50 "	"	3 50
7787B.	do. " " 8,	" " 3 " " 100 "	"	5 50
7787C.	do. " " 8,	" " 3 " " 33 "	"	2 70
7787D.	do. " " 8,	" " 3 " " 66 "	"	4 25



No. 7810.



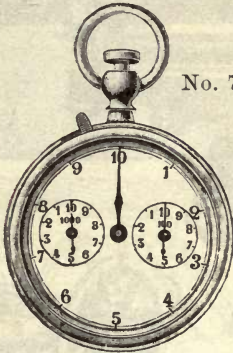
7818.

7810.	Steel Arrows, W. G. 6, bright, 14 in., set of 11	set	\$ 1 50
7811.	do. do. " " 9, " 14 " " 11	"	1 00
7812.	do. do. " " 9, japd. 12 " " 11	"	1 20
7813.	do. do. " " 11, bright, 12 " " 11	"	90
7814.	Brass do. " " 6, " 12 " " 11	"	2 00
7815.	Iron do. " " 9, " 14 " " 11	"	60
7818.	Steel Arrows, W. G. 6, bright, 14 in., with white enameled disc, 2½" diam., with red figures 1 to 11, set of 11	"	5 00
7819.	Canvas Carrying Case for No. 7818, with shoulder strap	each	2 50

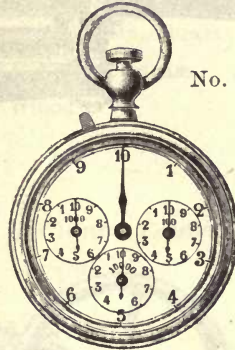


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# TALLYING MACHINES.

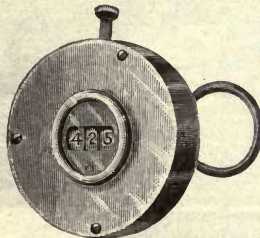


No. 7846.



No. 7847.

7846. Tallying Machine, for keeping count by pressing on a knob,  
nickel-plated watch case, porcelain dial, 3 numbered  
dials registering to 1000, with lever for setting hands  
to zero . . . . . each \$ 4 00
7847. do. do. do. but with 4 numbered dials,  
registering to 10,000 . . . . . " 5 50

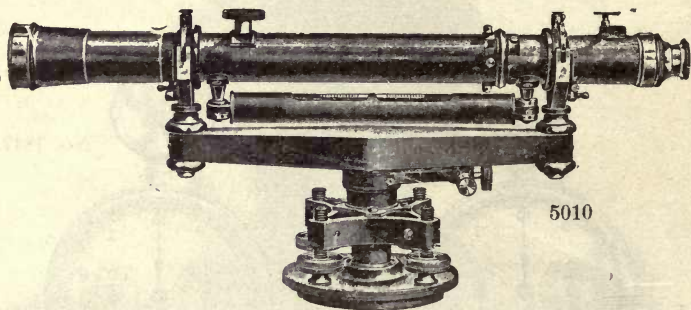


No. 7854.

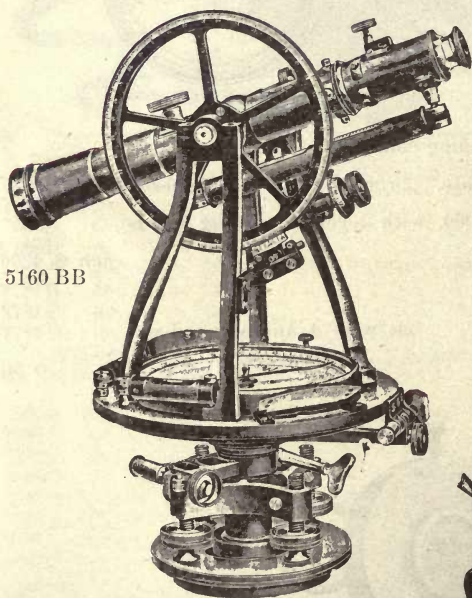
7854. Tallying Machine, for keeping count by pressing on a knob,  
nickel-plated, registers to 999 . . . . . each 2 50

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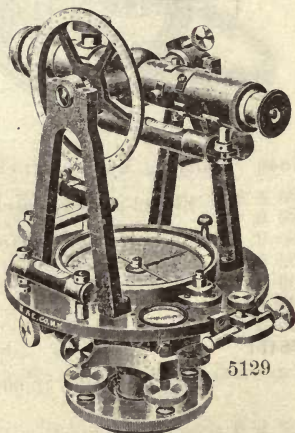
We are the largest manufacturers of Surveying Instruments,  
LEVELS, TRANSITS, LEVELING RODS,  
RANGING POLES, ETC.



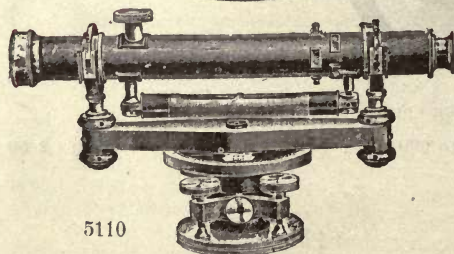
5010



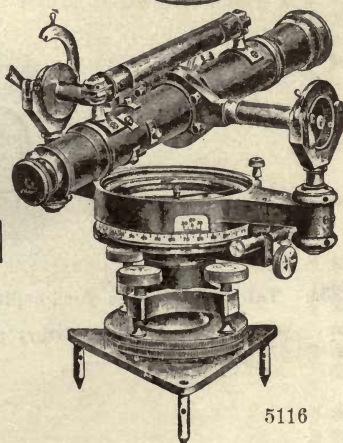
5160 BB



5129



5110



5116

See our General Catalogue (500 pages.)

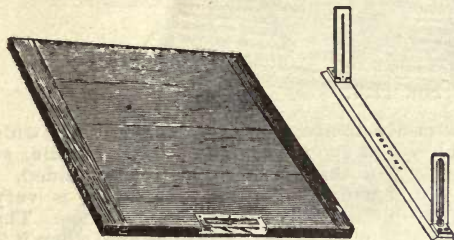


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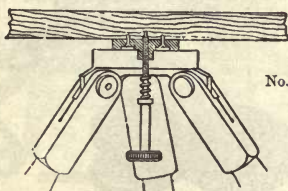


No. 5745

**Penta-Prism Range Finder**, for determining distances from a short base line by sighting, and determining right angles.

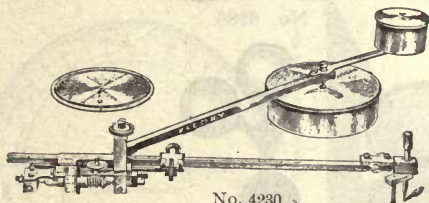


**Traverse Table**, simple construction, brass alidade, trough compass, hardwood tripod.



No. 5214

**Plane Tables**, various patterns.



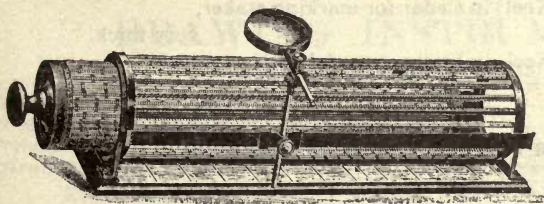
No. 4230

**Planimeters**, all kinds. Indicator Planimeters, Polar Planimeters, Compensating Planimeters, Pantograph Planimeters, Spherical Planimeters, Rolling Planimeters, Integrators, Integrator.



**Reckoning Machines** for 12, 16 and 18 figures.

Calculations, such as Addition, Subtraction, Multiplication, Division, Squaring, Cubing, Extracting of Square Roots, etc., can be performed with rapidity and un-failing accuracy and without mental effort by means of this machine.



**Thacher Calculating Instrument**, reads to four places, fifth place can be estimated.

See our general (500 page) catalogue.

No. 4013.

KEUFFEL & ESSER CO. NEW YORK.

## K & E FOLDING POCKET RULES.



No. 1727.

These Rules are made of carefully tempered spring steel,  $\frac{3}{8}$  in. wide and graduated on both sides. They fold up smaller than any other rule, so that the 12 fold three foot rule is only  $\frac{3}{8}$  in. thick  $\times$   $3\frac{3}{8}$  in. long when folded.

The divisions are sharp and accurate and the numbering is very distinct on dark ground. It runs in opposite directions on two sides. The aligning springs at the joints hold the rule in a rigid straight line when it is opened without in any way interfering with folding it.

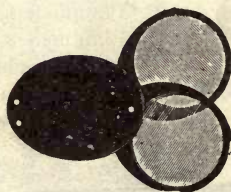
Lengths 1, 2 or 3 feet (4, 8, 12 fold) in  $\frac{1}{16}$  in.  $\times$   $\frac{1}{16}$  in., or  $\frac{1}{16}$  in.  $\times$   $\frac{1}{100}$  ft., the 3 ft. also  $\frac{1}{16}$  in.  $\times$  mm.



No. 6980.



No. 6986.



No. 7002.



No. 7008.

These glasses have a large, flat field and good magnifying power and are well adapted for reading graduations on Surveying and Forestry Instruments.

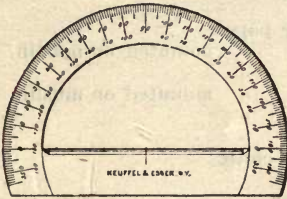


No. 3400.

- |       |   |
|-------|---|
| 3400. | Red Chalk (Keel) in Cedar for marking stakes,         |
| 3401. | " " " " very thick.                                   |
| 3402. | Red Chalk (Keel) in Sticks, covered with paper, thin. |
| 3403. | " " " " medium.                                       |
| 3404. | " " " " thick.  |

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No. 1241.

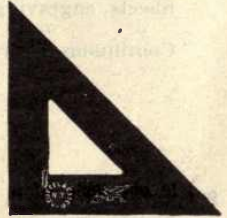
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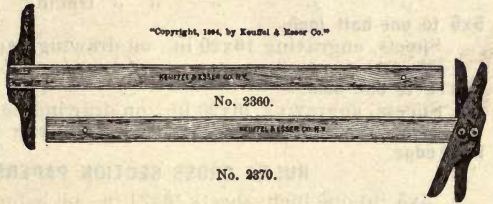
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1803.



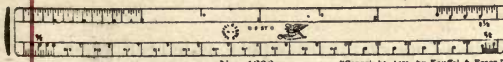
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